ITEA's 67th Annual Conference,
Kansas City, Missouri, USA April 3-5, 2005

A Study on Technology Teachers' Sense of Efficacy in Taiwan —Scoped on the Junior-High School

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Abstract

The development of technology education in Taiwan has been in a huge change since the new Grade 1-9 Curriculum was fully and nationwide implemented in the 2004 school year; the two curriculum, Living Technology and Science, have been combined into the new learning areas—named "Science and Technology" for the new Grade 1-9 Curriculum. All of the teachers of grade 1-9 almost have had no choice but facing the impact that was caused by the implementation of the new curriculum. The study was aimed to the sense of instructional efficacy of the technology teachers of junior high schools under the existing conditions in Taiwan. To fulfill the study purposes, a questionnaire survey was utilized to gather the data from the in-service Living Technology teachers of junior high schools in Taiwan. The seven main conclusions as following were drawn from survey findings: (1) LT teachers' senses of instructional efficacy in junior high school in Taiwan need to regard and promote in near future. (2) The situation of science teachers dominate the whole curriculum of LT is more than 23%. This caused many LT teachers are not able to teach LT curriculum or teach a few. (3) Most of LT teachers have part-time position to spend time in administration. This seems a signal of Taiwan's LT in the crisis. (4) The evaluation to the job value of teaching LT in junior high school, most of the LT teachers felt disheartened at government's policy of technology education and acquired other instructional license in order to keep the other teaching job in future. (5) The present situation of technology education of junior high schools in Taiwan is in the risk. All of the three main factors of affecting LT teachers' senses of instructional efficacy come from administration of their schools, the government, and the community or society. There will have no spaces or opportunities for LT instruction in junior high schools in Taiwan in future.

Keywords: technology teacher, living technology instruction, teachers' sense of efficacy, sense of instructional efficacy

Introduction

I. The current development of Technology education in junior high school in Taiwan

The development of technology education in Taiwan has been in a huge change since the new Grade 1-9 Curriculum was fully and nationwide implemented in the 2004 school year; the two curriculum, Living Technology and Science, have been combined into the new learning areas—named "Science and Technology" for the new Grade 1-9 Curriculum. The teacher always plays the critical role whatever is in the processes of instruction or implementation of curriculum. Therefore it is important to

inquire the teacher's related situation on facing the curriculum reform in the point of it implementation fully and nationwide.

It is obviously, the combination on science and technology curriculum has made a lot of impacts on technology education in Taiwan. And the actual condition of instructional arrangement of grade 7th to 9th for the new Grade 1-9 Curriculum in many junior high schools has made many Living Technology teachers in the trouble, influenced them to take the priority of teaching Living Technology, and affected their related status and allocations.

The situation of technology instruction in junior high school in Taiwan was stepping in a new milestone or in the turning point of crisis when the new Grade 1-9 Curriculum was fully implemented. There is the Academic Attainment Testing designed to evaluate the applicant for admission to a general high school, vocational high school or 5-year junior college that graduate from junior high school. In generally, there exists an especial phenomenon in Taiwan that the testing leading the education. Unfortunately, the testing includes five subjects: Mandarin, English, Mathematics, Science, and Social Studies. This fact that Living Technology is excluded from the testing subjects has caused some abnormal practices occurred in junior high school in Taiwan. Many Administrators of junior high school would rather arrange main instructional resources, time, and pay regard to the five testing subjects than others. The curriculum implementation of elementary and secondary education in Taiwan seems more decentralized than ever. And it seems no limitation or disciplinary punishment for that even if contravenes the Grade 1-9 Curriculum Guidelines on practices of instructional administration. The position of technology education in grade 1-9 in the future should be paid more regards than now.

The research result of Hsieh, Chang, and Lee (2004) illustrated that most of junior high schools in Taichung City in Taiwan, the Science teachers have dominated whole the curriculum of Living Technology; and most Living Technology teachers have moved to teach subjects other than 'Science and Technology' or spend time in administration.

II. Change of the Teacher Education Law for primary and secondary education in Taiwan

In past years, the teacher of grade 1-6 was educated, trained, and prepared by nine Teachers-Colleges, and the teacher of grade 7-9 was mainly prepared by three teacher educating institutions: National Taiwan Normal University (NTNU)-located in northern Taiwan, National Changhua University of Education (NCUE)-located in central Taiwan, and National Kaohsiung Normal University (NKNU)-located in southern Taiwan. Most of qualified LT teachers were mainly graduated from the departments of Industrial Technology- converted from Industrial Arts Education, Industrial Education of the above three universities.

In 1994, the Teacher Education Law was amended to increase the channels of teacher education and training. After then, all public and private universities and colleges may participate in teacher education and training in their departments, graduate institutes, educational colleges, and/or teacher

education centers. Thus and thus, the competition increases and the opportunity reduced of being a technology teacher, and the space of professional instruction has been narrowed down or deprived. Some of technology teachers had to be retrained for getting other instructional opportunity or to accept a part-time position for reducing the teaching hours (Hsieh, Chang, and Lee, 2004).

III. The impact on technology teacher's sense of efficacy

Under the situation listed as above, the technology teacher of junior high school should have been in a fix. The allocations of technology teachers in junior high school have being supplanted by science teachers by degree. What is the situation of technology teacher's sense of instructional efficacy of junior high school in Taiwan? And how did they feel that the technology education will be in the future? It is an important problem now in Taiwan.

Purpose

This study aimed to explore the in-service technology teachers' sense of efficacy in junior high school, and some important variables of personal background if affect their senses of instructional efficacy. The five inquiring questions were addressed as following:

A. What are the degrees of in-service technology teachers' senses of instructional efficacy in junior high school?

A-1 How about the sense of instructional efficacy in student engagement?

A-2 How about the sense of instructional efficacy in instructional strategies?

A-3 How about the sense of instructional efficacy in classroom management?

B. Did the different personal backgrounds of technology teachers in junior high schools affect their senses of instructional efficacy, as examples: education, years of teaching experience, and status of professional instruction arrangement?

C. What are the main factors of affecting the technology teacher's sense of instructional efficacy?

D. What are the main items of promoting the technology teacher's sense of instructional efficacy according to above main factors?

Literature Review

I. Definition of teacher's sense of efficacy

Many researches in recent years have given a great attention to the importance of the concept of teacher's sense of efficacy in understanding teachers' behaviors in the instructional process. It is based on teacher efficacy. Teacher efficacy was defined as a teacher's judgment of his or her capabilities to bring about desired outcomes of student engagement and learning, even among those students who may be difficult or unmotivated (Tschannen-Moran and Hoy, 2001). It has been found one of the few variables consistently associated with positive teaching behavior and student outcomes (Ashton and

Webb, 1986; Woolfolk and Hoy, 1990). It is the teachers' beliefs about their own capacities as teachers. The development of strong efficacy beliefs among service teachers would be one indication that coursework and practice impacts a teacher's classroom effectiveness (Housego, 1992; Hoy and Woolfolk, 1993).

Gibson and Dembo (1984) identified two components of teacher efficacy: personal teacher efficacy and general teacher efficacy. The construct of personal teaching efficacy, based on Bandura's (1977) theory of self-efficacy, refers to a teacher's belief about his or her abilities as a teacher. The construct of general teaching efficacy is based on Bandura's (1977) concept of outcome expectancy, which is an individual's belief about "the degree to which the environment can be controlled, that is, the extent to which students can be taught given such factors as family background, IQ, and school conditions" (Gibson and Dembo, 1984: 570). As regards of the sense of instructional efficacy, is related to teacher's expectancy of the instruction that affects students' learning behaviors and results (Ashton and Webb, 1986).

II. Importance of teacher's sense of efficacy

The teacher's sense of efficacy may influence their emotive state, their goal setting, their level of aspiration, and their persistence (Ashton and Webb, 1986), the teachers' effort in teaching (Allinder, 1994; Deshler, 2003).In addition, teachers' beliefs of sense of efficacy also relate to their behavior in the classroom. The teachers who with a strong sense of efficacy, may tend to exhibit greater levels of planning, organization, and enthusiasm (Allinder, 1994), and then will further affect teachers presenting their capability to impact students' motivation and achievement. Thus the teachers' sense of efficacy has been related to students' outcomes such as achievement (Ashton and Webb, 1986; Ross, 1992; Tschannen-Moran and Woolfolk Hoy, 2002), motivation (Midgley, Feldlaufer, and Eccles, 1989; Tschannen-Moran and Woolfolk Hoy, 2002), and students' own sense of efficacy (Anderson, Greene, and Loewen, 1988; Tschannen-Moran and Woolfolk Hoy, 2002).

Additionally, they may be more open to new ideas and be more willing to experiment with new methods to better meet the needs of their students (Guskey, 1988, Stein and Wang, 1988). Further, the sense's beliefs of efficacy may influence teachers' persistence when things do not go smoothly and their resilience in the face of setbacks. Greater levels of efficacy also enables teachers to be less critical of students when they make errors (Ashton and Webb, 1986), to work longer with a student who is struggling (Gibson and Dembo, 1984).

Henson (2001) postulated that in establishing an effective learning environment, a teacher's belief in his/her ability to positively facilitate student learning impacts classroom management behavior. Teachers with a higher sense of efficacy tended to favor more humanistic and less controlling classroom management orientations in how they handle their students' behaviors (Enochs, Scharmann, and Riggs, 1995; Henson, 2001; Woolfolk and Hoy, 1990; Woolfolk, Rosoff, and Hoy, 1990).

According to Deshler (2003) stated, teachers who have a high sense of efficacy believe deeply that good teaching can make a difference with all students, regardless of external obstacles (such as home environment and students' ability), while teachers with low efficacy express the belief that good teaching cannot outweigh those kinds of influences. Additionally, high efficacy teachers see at-risk students as reachable and teachable and demonstrate a sense of personal responsibility for the success and failure of all students. They take pride in being able to teach students seen as unteachable by others. Clearly, master teachers have a high sense of efficacy. They believe that they can, indeed, make a difference in the lives of the students that they teach. They see themselves as being a transformative force in the lives of their students. They have a firm belief that quality teaching can result in dramatic growth for students. As a consequence, they will go the extra mile in doing everything within their power to effectively teach and reach each of their students. A teacher's performance will relate to his/her feelings of competence or expectation of personal effectiveness. It will determine the amount of effort a person is willing to put forth to complete a task.

In summary, one's sense of efficacy is a cognitive mechanism governing one's behavior and it follows that one's beliefs (Bandura, 1993). A teacher's sense of efficacy influences his or her thoughts and feelings, emotion and motivation, choice of activities, the amount of effort expended with students, and the extent of persistence shown in the face of challenging circumstances. Thus, we may get some reference information for prejudication of the effort invests in instruction from the degrees of teacher’s sense of efficacy. The development of strong efficacy beliefs among service teachers would be one indication that coursework and practice impacts a teacher's classroom effectiveness (Housego, 1992; Hoy and Woolfolk, 1993).

III. The scale of teacher’s sense of efficacy

There were several scales developed for investigating teacher’s sense of efficacy in many researches. After searching and reviewing, the Ohio State Teacher Efficacy Scale (OSTES) that was developed and presented at the Ohio State University by Tschannen-Moran, Woolfolk Hoy, and Hoy (1998), was the better one than the Webb Efficacy Scale (Ashton and Webb, 1982), the Rotter I-E Scale (Internal external locus of control scale) (Rotter, 1966), or the teacher efficacy scale of Gibson and Dembo (1984). It addressed the detail directions of the scale structures and related information, for example: construct validity, factors, subscale scores, and reliabilities.

The OSTES was modified and combined with other investigating items to form an instrument of survey.

Study Design

I. Study framework

As Figure A illustrates, this study adapted the concept of systematic procedure model from input,

process, and output to feedback, to design the study's structure in stages.

Stage A: Input

The main tasks in this stage were to search the theory of teacher's sense of efficacy (TSE), the factor of TSE, and the scale for testing TSE, etc. Those were the foundation established for the next stage.

Stage B: Process

The main tasks in this stage were to develop questionnaire, sample, survey, collect data, and data analyze, then the result or finding of data analyze were discussed according to the study purpose.

Stage C: Output

The tasks of this stage were to state the conclusion and propone the suggestion.

After whole the stages were finished, a treatment for feedback was done to contrast the result with study purpose.

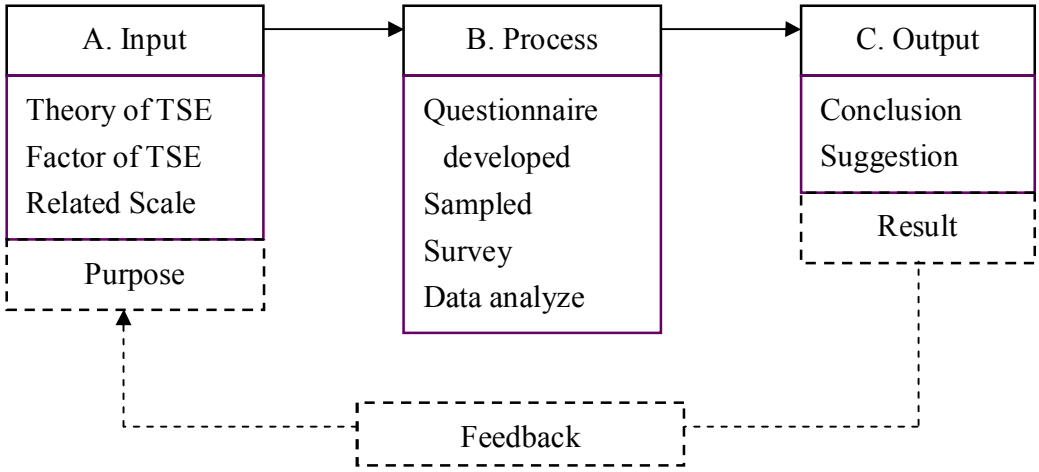

Figure A. Study framework

II. Method

To fulfill the study purposes, the methods-- literature review and questionnaire survey, were utilized. The use of two methods and implementation procedures were illustrated below.

Literature review

For establishing the research foundation and composing the investigating questionnaire, many of the literature about sense of efficacy were collected and reviewed.

Questionnaire survey

In order to acquire actual data of instructional arrangement for the learning areas of 'Science and Technology' of new Grade 7-9 Curriculum with reality, the research sample was focused on the

qualified technology teacher in junior high school and the purposive sampling was utilized to form the investigated population.

The research instrument, named 'A Survey on Technology Teachers' Sense of Instructional Efficacy of Junior High Schools in Taiwan,' consisted of four parts: a cover letter, a scale of sense of instructional efficacy (SSIE), the main factors affecting the technology teacher's sense of instructional efficacy, and the Basic data of testee. SSIE was translated from the English into the Chinese and modified from the Teachers' Sense of Efficacy Scale (TSES) that was a nine point Likert's-type scale developed by Tschannen-Moran and Woolfolk Hoy (2001) in Ohio State University. The SSIE was finally utilized in a five point Likert's-type scale ((1) can do "None at all" to (5) can do "A Great Deal") that included the twenty four items, same as TSES used, for investigating. Its' reliabilities were found after surveying and statistic, the Cronbach's alpha value of whole 24 items and each subscales were: 0.93 (24 items), 0.82 (Efficacy in Student Engagement), 0.88 (Efficacy in Instructional Strategies), and 0.86 (Efficacy in Classroom Management).

To inquire what are the main factors affecting the technology teacher's sense of instructional efficacy, the twelve items were the parts of two study's conclusions those made by Hsu (1996, 1999).

Finding and Discussion

The questionnaires were designed and saved in Web database and opened on January 15, 2005. Then one hundred and fifty in-service technology teachers in Taiwan were invited and noticed by e-mail to fill the web survey and closed on March 10, 2005. All of received data from Web database were 86 valid responses.

After data analyzing, some findings and the discussions of the survey are illustrated as follows:

A. The degree of in-service technology teachers' senses of instructional efficacy (TTSIE) in junior high school is medium (Mean = 3.6342, SD = .4330), a few more than the average (3.5).
   A-1 the degree of sense of instructional efficacy in student engagement (SE) is poor (M = 3.3561, SD = .4495), lower than the average.
   A-2 the degree of sense of instructional efficacy in instructional strategies (IS) is medium (M = 3.7020, SD = .5206), a few more than the average.
   A-3 the sense of instructional efficacy in classroom management (CM) is also medium (M = 3.8445, SD = .4517), a few more than the average.

All of the degrees of in-service technology teachers' senses of instructional efficacy are scored medium. Technology teachers' senses of instructional efficacy might need to regard.

B. The situation of different personal backgrounds of technology teachers in junior high schools affects their senses of instructional efficacy
   B-1 the variety of sex that affects their senses of instructional efficacy is not significant: (The Total TTSIE's t = -.478, p = .634; SE's t = -.713, p = .478; IS's t = -.397, p = .692;

CM's t = -.209, p = .835)

B-2 the variety of teaching experience years that affects their senses of instructional efficacy is not significant:
(The Total TTSIE's F = .190, p = .903; SE's F = .294, p = .830; IS's F = .380, p = .767 CM's F = .436, p = .728)

B-3 the variety of education that affects their senses of instructional efficacy is not significant:
(The Total TTSIE's F=1.840, p=.179; SE's F=1.561, p=.215; IS's F=1.033, p=.312; CM's F=2.197, p=.142)

B-4 the variety of status of professional instruction arrangement that affects their senses of instructional efficacy is not significant:
(The Total TTSIE's F=1.932, p=.113; SE's F=2.220, p=.074; IS's F=1.804, p=.136; CM's F=1.451, p=.225)

C. The three main factors that affect the technology teacher's sense of instructional efficacy are:
1st—'The priority of professional instruction' (61.6%)
2nd—'The coordination with related administration' (43.0%)
3rd—'Appreciated by community or society' (40.7%)

The result presented that 'the priority of professional instruction' is the most concerned in teaching of technology teachers. In additional, the administration of instruction and the appreciation from community or society are also the main factors to influence the technology teachers' senses of instructional efficacy.

D. The main items to promote the technology teacher's sense of instructional efficacy are:
1st—'Appreciated by community or society' (72.1%)
2nd—'The coordination with related administration' (70.9%)
3rd—'The priority of professional instruction' (70.9%)
4th—'Government policies' (59.3%)

For promoting the technology teacher's sense of instructional efficacy, to facilitate 'Appreciated by community or society', better 'The coordination with related administration', brush up 'The priority of professional instruction', and improve 'Government policies' might be the good the ways.

E. The percentage that technology teacher has a part-time position of this study is more than 55.8%.

This finding matches the research result of Hsieh, Chang, and Lee (2004). There may have some reasons behind the high percentage for technology teachers to have, gain, and accept a part-time position of administration.

F. The class hours for teaching Living Technology per week in this semester: '6 hrs or less' is 52.3%; '7-12hrs' is 32.6%.

The status of lower class hours on LT might point out or prove the fact of its decreasing trend in junior high schools. It is necessary to find the solution of normal implementation for technology instruction based on the

Grade 1-9 Curriculum Guidelines.

G. The actual situation on professional instruction arrangement for Science and Technology areas in this semester is:

G-1 Science teachers teach the learning area of Science, technology teachers teach the learning area of Living Technology-- *44.2%*.

G-2 Science teachers dominate all the instruction on Science and Living Technology Areas, the Living Technology teachers were arranged for other courses teaching--*23.3%*.

Although the appropriate professional instruction arrangement for the instruction of Science and Technology learning areas has 44.2%, there are 23.3% of science teachers dominating all the instruction on Science and Living Technology Areas. The rate is presenting an abnormal phenomenon in junior high schools in Taiwan.

H. To evaluate the job value of teaching Living Technology in junior high school now:

H-1 I have acquired other instructional license to do, because I feel disheartened at government's policy of technology education and guess that the Living Technology will disappear from junior high school in Taiwan--*62.8%*.

H-2 Teaching Living Technology in junior high school is my career; I will devote myself to that--*15.1%*.

The result showed a serious issue, a great percentage of technology teachers who participated this survey have acquired other instructional license to do.

Conclusion and Suggestion

I. Conclusion

The five conclusions obtained from this study are summarized as follows:

(1) LT teachers' senses of instructional efficacy in junior high school in Taiwan need to regard and promote in near future.

(2) The situation of science teachers dominate the whole curriculum of LT is more than 23%. This caused many LT teachers are not able to teach LT curriculum or teach a few.

(3) Most of LT teachers have part-time position to spend time in administration. This seems a signal of Taiwan's LT in the crisis.

(4) The evaluation to the job value of teaching LT in junior high school, most of the LT teachers felt disheartened at government's policy of technology education and acquired other instructional license in order to keep the other teaching job in future.

(5) The present situation of technology education of junior high schools in Taiwan is in the risk. All of the three main factors of affecting LT teachers' senses of instructional efficacy come from administration of their schools, the government, and the community or society. There will have no spaces or opportunities for LT instruction in junior high schools in Taiwan in future.

II. Suggestions

According to the findings drawn above, the four suggestions were addressed as followings:

(1) It is necessary of fully implementing the curriculum evaluation for technology education.

The facts of technology instruction in junior high schools are reflecting the abnormal arrangement for the new Grade 1-9 Curriculum Guidelines in the practices. For keeping in the right way of curriculum reform and checking its efficiency of implementation, an appropriate curriculum evaluation for the grade 1-9 curriculum has to be planned and run in the coming years in Taiwan.

(2) The principal and the registrar of junior high schools in Taiwan should present their educational vision and do their efforts on assisting to reach goals of the Grade 1-9 Curriculum.

Instructional arrangements and teacher allocations should keep in legal condition and the principal and the registrar of the junior high school have to be disciplined to entirely accomplish educational goal. Thus, the situations of science teachers dominate the whole curriculum of LT and the decrease of LT class hours have to be rectified and normalized soon.

(3) Technological literacy education in Taiwan should be established and implemented in a stand-alone learning area.

Technological literacy education should be highly valued to conform to the tendency in technology-advanced countries and established and implemented in a stand-alone learning area. In England, Australia and New Zealand, technology is a stand-alone learning area. In Taiwan, the technology educators should keep doing efforts to promote technological literacy and its education. In order to avoid worsening LT teaching quality, the 'Science and Technology' curriculum guides should be divided into two separate learning areas in the coming curriculum (Hsieh, Chang, and Lee, 2004).

(4) LT teachers' missions in their educational careers should be insisted on defending the legal priority of curriculum implementation.

Facing the disadvantageous situations, all of the LT teachers must dare to speak out, and positively strive for LT teaching hours to school administrator or the Curriculum Development Committee in their schools. And LT teachers should insist their professional roles and the in-service teachers currently having administrative positions should take a stand to defend the legal place and legitimacy of LT curriculum (Hsieh, Chang, and Lee, 2004).

Finally, this paper stated the situation and status of LT teachers of junior high schools in Taiwan, and found that the LT instruction is in the unexampled crisis. To give more efforts, to insist the educational ardor, and promote the status for LT education is now or never.

Bibliography

1. Allinder, R. (1994). The relationship between efficacy and the instructional practices of special education teachers and consultants. Teacher Education and Special Education, 17(2), 86-95.
2. Anderson, R., Greene, M., and Loewen, P. (1988). Relationships among teachers' and students' thinking skills, sense of efficacy, and student achievement. The Alberta Journal of Educational Research, 34(2), 148-165.

3. Ashton, P. (1985). Motivation and teacher's sense of efficacy. In C. Ames and R. Ames (Eds.), Research on Motivation in Education: Vol. 1, 141–71. Orlando, FL: Academic Press.
4. Ashton, P., and Webb, R. (1986). Teachers' sense of efficacy, classroom behavior, and student achievement. In P. T. Ashton and R. B. Webb (Eds.), Teachers' sense of efficacy and student achievement, 125-144. New York and London, Longman.
5. Bandura, A. (1977a). Self-efficacy: Toward a unifying theory of behavioral change. Psychological Review, 84(2), 191-215.
6. Bandura, A. (1977b). Social learning theory. Orrville, Ohio: Prentice Hall.
7. Bandura, A. (1981). Self-efficacy thought: A developmental analysis of self-efficacy. In J. Flavell and L. Ross (Eds.), Social cognitive development: frontiers and possible future, 200-239. Cambridge: Cambridge University.
8. Bandura, A. (1993). Perceived Self-Efficacy in Cognitive Development and Functioning. Educational Psychologist, 28(2), 117-148.
9. Bandura, A. (1997). Self-efficacy: The exercise of control. New York: Freeman.
10. Deshler, D. (2003). Effective teaching involves more than checklists and mnemonics. SIM Article Archives. October. A version of this article originally appeared in the January 2002 issue of Stratenotes, a newsletter for SIM Trainers.
11. Enochs, L., Scharmann, L. ,and Riggs, I. (1995). The relationship of pupil control to preservice elementary science teacher self-efficacy and outcome expectancy. Science Education, 79 (1), 63-75.
12. Fuller, B., Wood, K., Rapoport, T., and Dornbusch, S. (1982). The organizational context of individual efficacy. Review of Educational Research, 52(1), 7-30.
13. Gibson, S. and Dembo, M. (1984) Teacher efficacy: a construct validation. Journal of Educational Psychology, 76, 569-582.
14. Guskey, T. (1988). Teacher efficacy, self-concept, and attitudes toward the implementation of instructional innovation. Teaching and Teacher Education, 4 (1), 63-69.
15. Henson, K. (2001). Curriculum planning: Integrating multiculturalism, constructivism, and education reform. New York: McGraw-Hill.
16. Housego, B. (1992). Monitoring student teachers' feelings of preparedness to teach, personal teaching efficacy, and teaching efficacy in a new secondary teacher education program. The Alberta Journal of Educational Research, 38(1), 49-64.
17. Hoy, W. and Woolfolk, A. (1993). Teachers' sense of efficacy and the organizational health of schools. The Elementary School Journal, 93, 356-372.
18. Hsu, H. (1996). A confirmatory study of vocational teachers' sense of efficacy in junior colleges of Republic of China. A doctoral dissertation of Department of Industrial Education of National Taiwan normal University.

19. Hsu, H. (1999). Research on causes and effects of technical and vocational teachers' sense of efficacy in junior college. A report of funding project of National Science Council of Taiwan, R. O. C. (No.: NSC 88-2516-S-003-009)
20. Midgley, C., Feldlaufer, H., and Eccles, J. (1989). Change in teacher efficacy and student self- and task-related beliefs in mathematics during the transition to junior high school. Journal of Educational Psychology, 81(2), 247-258.
21. Milson, J. and Mehlig, M. (2002). Elementary School Teachers' Sense of Efficacy for Character Education. Journal of Educational Research, 96(1), 47-53. Sep/Oct.
22. Ross, J. (1992). Teacher efficacy and the effects of coaching on student achievement. Canadian Journal of Education, 17(1), 51-65.
23. Rotter, J. (1966). Generalized expectancies for internal versus external control of reinforcement. Psychological Monographs, 80 (whole no. 609).
24. Savran, A. and Çakıroğlu, J. (2003). Differences Between Elementary and Secondary Preservice Science Teachers' Perceived Efficacy Belies and their Classroom Management Beliefs. The Turkish Online Journal of Educational Technology (TOJET), 2(4), Article 3. http://www.tojet.net/articles/243.htm [Online data].
25. Stein, M. and Wang, M. (1988). Teacher development and school improvement: The process of teacher change. Teaching and Teacher Education, 4(2), 171-187.
26. Tschannen-Moran, M., and Woolfolk Hoy, A. (2001). Teacher efficacy: Capturing an elusive construct. Teaching and Teacher Education, 17(7), 783-805.
27. Tschannen-Moran, M. and Woolfolk Hoy, A. (2002). The Influence of Resources and Support on Teachers' Efficacy Beliefs. Paper presented at the annual meeting of the American Educational Research Association, Session 13.82: What is the value of understanding beliefs? An exploration of beliefs related to academic achievement. April 2. New Orleans, LA.
28. Wen-Pin Hsieh, Yung-Tsung Chang and Lung-Sheng Lee (2004). An Investigation of Living Technology Teacher Allocation and Status in the Junior High Schools in Taichung City. Paper presented at the 2004 International Conference on Industrial and Technology Education. Korea University of Technology and Education (KUT), South Korea. September 16-17.
29. Woolfolk, A., Rosoff, B., and Hoy, W. (1990).Teachers' sense of efficacy and their beliefs about managing students. Teaching and Teacher Education, 6, 137-148.
30. Yu, G.., Xin, T., and Shen, J. (1995). Teacher's sense of teaching efficacy: Its structure and influencing factors. Acta Psychologica Sinica, 27(2), 159-166.